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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/002,979	12/06/2001	Satoshi Maruyama	216935US0	4984
22850	7590	10/16/2008		
OBLON, SPIVAK, MCCLELLAND MAIER & NEUSTADT, P.C. 1940 DUKE STREET ALEXANDRIA, VA 22314				
EXAMINER				
CANTELMO, GREGG				
ART UNIT		PAPER NUMBER		
1795				
NOTIFICATION DATE		DELIVERY MODE		
10/16/2008		ELECTRONIC		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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### Office Action Summary

**Application No.**

10/002,979

**Applicant(s)**

MARUYAMA ET AL.

**Examiner**

Gregg Cantelmo

**Art Unit**

1795

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 30 July 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 17, 21 and 24-32 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 17, 21 and 24-32 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-8508)  
Paper No(s)/Mail Date \_\_\_\_\_

- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on July 30, 2008 has been entered.

### ***Response to Amendment***

2. In response to the amendment received July 30, 2008:
- Claims 17, 21, 24-32 are pending;
  - The prior art rejections of record are withdrawn in light of the amendment to the claims.

### ***Claim Rejections - 35 USC § 103***

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

3. Claims 17, 21, 24-28 and 31-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 2000-235868 (JP '868) in view of JP 04-190560 (JP '560).

JP '868 discloses a lithium secondary battery wherein: a cathode, anode and electrolyte are encased in a housing having a thickness of 0.5 mm or less (abstract), a cathode active substance comprising a lithium cobalt oxide (paragraph [0023]), and an electrolyte solution containing 50-95%  $\gamma$ -butyrolactone in the solvent (abstract and

paragraph [0049] and [201] as applied to claim 21). Notably the amount of  $\gamma$ -butyrolactone can be 75% specifically (see table on page 27)

The cathode binder is polyvinylidene fluoride (paragraph [0025] as applied to claim 17).

The negative electrode can be a carbonaceous material (para. [176] as applied to claim 24).

The electrolyte can include various gelling agents such as PAN, PVdF, PEO, etc. and thus can be gelled (paras. [59] as applied to claim 25).

The electrolyte component is disclosed at thickness of 25 micrometers (para. [215] as applied to claims 26-28). Polyvinylidene fluoride is added to the cell as an adhesive which produces gelling in part in the presence of the nonaqueous electrolyte (para. 59).

The solvent can also include ethylene carbonate (para. [216] as applied to claim 31) and the electrolyte salt is LiBF<sub>4</sub> (para. [216] as applied to claim 32).

The difference between claim and JP '868 is that JP '868 does not teach of the lithium cobalt oxide having 0.001-2 at% Nb relative to the cobalt in the composite oxide.

JP '560 discloses adding 0.001-0.4 of Niobium relative to cobalt in a lithium composite oxide active material for lithium batteries (abstract).

The motivation for adding 0.001-0.4 Nb is that it improves the high temperature storage property of the battery.

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of JP '868 by adding 0.001-0.4 Nb since it would have improved the high temperature storage property of the battery.

4. Claim 29 is rejected under 35 U.S.C. 103(a) as being unpatentable over JP '868 in view of JP '560 as applied to claims 21 and 25 above, and further in view of Periasamy et al. "Studies on PVdF-based polymer gel electrolytes" (hereafter referred to as Periasamy).

JP '868 teaches that the addition of various polymer materials with the electrolyte can serve to gel the electrolyte. Notably JP '868 identifies polyvinylidene fluoride as a gelling agent which can form a gelled electrolyte having improved ionic conductivity (para [59]).

The difference not yet discussed is of the polymer electrolyte being a homopolymer of poly(vinylidene fluoride) (claim 29).

While JP '868 does not disclose the thickness of the electrolyte, selection of such would have been well within the skill of the ordinary worker in the art. Generally, differences in ranges will not support the patentability of subject matter encompassed by the prior art unless there is evidence indicating such ranges is critical. In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980). In re Aller, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955). In re Hoeschele, 406 F.2d 1403, 160 USPQ 809 (CCPA 1969).

Use of gel polymer electrolytes in the claimed thickness ranges is further taught by Periasamy which teaches of using lithium cobalt oxide cathodes in combination with

a PVdF-based gel polymer electrolyte having a thickness of 50 micrometers (abstract and section 2. Experimental as applied to claims 26-29).

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of JP '075 to use a homopolymer of PVdF as taught by Periasamy since it would have provided a solid polymer electrolyte system having high ionic conductivity, good mechanical stability, a wide electrochemical stable window and a stable lithium interface. The selection of a known material based on its suitability for its intended use supported a prima facie obviousness determination in *Sinclair & Carroll Co. v. Interchemical Corp.*, 325 U.S. 327, 65 USPQ 297 (1945) See also *In re Leshin*, 227 F.2d 197, 125 USPQ 416 (CCPA 1960). MPEP § 2144.07. In using the PVdF gel-based electrolyte of Periasamy, one of ordinary skill in the art would have further appreciated employing an electrolyte thickness of about 50 microns which reasonably encompasses or suggests the thickness ranges of claims 26-28. Generally, differences in ranges will not support the patentability of subject matter encompassed by the prior art unless there is evidence indicating such ranges is critical. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980). *In re Aller*, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955). *In re Hoeschele*, 406 F.2d 1403, 160 USPQ 809 (CCPA 1969). It has been held that when the difference between a claimed invention and the prior art is the range or value of a particular variable, then a prima facie rejection is properly established when the difference in the range or value is minor. *Titanium Metals Corp. of Am. v. Banner*, 778 F.2d 775, 783, 227 USPQ 773, 779 (Fed. Cir. 1985).

5. Claim 30 is rejected under 35 U.S.C. 103(a) as being unpatentable over JP '868 in view of JP '560 and Periasamy as applied to claim 29 above, and further in view of Humphrey of record.

The difference not yet discussed is of the PVdF polymer being produced by an emulsion polymerization process.

With respect to a PVdF polymer obtained from emulsion polymerization: Humphrey discloses an electrode composition comprising a PVdF homopolymer (abstract and col. 5, ll. 9-43). The PVdF is preferably formed by emulsion polymerization to provide for a high-purity polymer.

The motivation for employing a PVdF homopolymer obtained by emulsion polymerization is it that it would have provided a higher purity polymer.

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of JP '075 in view of Periasamy by employing a PVdF homopolymer obtained by emulsion polymerization since it would, have provide a higher purity polymer.

#### ***Response to Arguments***

6. Applicant's arguments with respect to claims 17, 21 and 24-32 have been considered but are moot in view of the new ground(s) of rejection.

#### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gregg Cantelmo whose telephone number is 571-272-1283. The examiner can normally be reached on Monday to Thursday, 8:30-6:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Pat Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Gregg Cantelmo/  
Primary Examiner, Art Unit 1795